

Why Virginia Citizens Have Cause for Concern from Sludge Content Exposure:

Articles have been circulated, by sludge-use promoters, throughout the Expert Panel's tenure relative to Virginians become HYSTERICAL about sludge pollution (AKA 'biosolids') being applied within their communities and in close proximity to drinking water wells and family residences.

Is there a cause for concern v. hysteria? You be the judge after considering the facts:

EPA Office of Inspector General Status Report

Land Application of Biosolids

2002-S-000004, March 28, 2002

MEMORANDUM SUBJECT: Status Report: Land Application of Biosolids Report No. 2002-S-000004

FROM: Judith J. Vanderhoef, Project Manager Headquarters Audit/Evaluation Resource Center (2443)

"Attached is a status report on land application of biosolids. This report provides biosolids program information relating to EPA and State staff, State delegation, land application data for seven States, responding to and tracking health complaints, risk assessment and pathogen testing concerns, EPA's relationship with the Water Environment Federation, and public acceptance\ concerns. The report is based, in part, on work we did in response to an allegation citing numerous problems with the biosolids program.

In March 2001, the National Whistleblower Center submitted a series of allegations to the EPA Office of the Inspector General (OIG) concerning EPA's conduct in regard to regulating biosolids.

The allegations by the Center were based largely on issues raised by an EPA research scientist. In addition, a previous OIG audit on biosolids, issued in March 2000, found inadequacies in EPA's management and enforcement of the biosolids program. For these reasons, we are providing a status report on land application of biosolids. The specific issues we examined, as well as the status of each, are summarized below.

EPA and State Biosolids Program Staff. Some State officials have expressed concerns that EPA is not dedicating sufficient staffing and financial resources to the program. Nonetheless, EPA continues to place a low priority on the program, and staff assigned to the biosolids program have been declining. For example, at the Regional level, EPA had dedicated 18 full-time equivalent (FTE) positions to biosolids in 1998 but only 10 FTEs in 2000. At the State level, staff assigned to biosolids vary significantly, with nearly half of the States dedicating one or fewer FTEs to biosolids. EPA's position is that the resources allocated to the biosolids program are appropriate when balanced against competing priorities.

Delegation of the Biosolids Program to the States. The Clean Water Act gives EPA authority to delegate the biosolids program to States, but little progress has been made thus far. Only five States have received formal delegation from EPA for the biosolids program. Given EPA's lack of resources devoted to the Federal program, EPA cannot be certain that all citizens in non-delegated States are provided at least the same level of protection as in the Federal program. Regarding tracking, EPA had no formal process.

EPA does not plan to complete a comprehensive evaluation and monitoring study to address risk assessment uncertainties. In addition, there are indications that more research on pathogen testing is needed.

EPA's Relationship with a Professional Association. The National Whistleblower Center expressed concern about EPA's support of the Water Environment Federation, a professional association. However, of the \$12.9 million EPA provided over a 3-year period to the Water

Environment Federation and a research organization the Federation created, 96 percent of that amount (\$12.4 million) had been Congressionally mandated and EPA had no discretion in awarding these funds.

There are public concerns regarding the impact of biosolid land application on health, quality of life, and natural resources. These concerns have led a number of counties and municipalities to ban or restrict the land application of biosolids. Public perception regarding biosolids land application can have a significant impact on the implementation of the program.

Other interested stakeholders have also raised concerns about land application. In addition, a previous OIG audit on biosolids, issued in March 2000, found inadequacies in EPA's management and enforcement of the biosolids program which, to date, have not been resolved.

The Act's requirements for more effective removal of pollutants from wastewater have resulted in the production of large quantities of sewage sludge. Because sewage sludge may contain toxic pollutants and disease-causing organisms, failure to properly manage sewage sludge may have adverse effects on human health and the environment.

- Class A: The Rule requires that pathogens in these biosolids be reduced to below detectable levels. Within Class A, Exceptional Quality (EQ) biosolids meet the Rule's most stringent metals limits. The Rule places no restrictions on the land application of EQ biosolids, but it does place restrictions on Class A biosolids that do not meet the stringent metals limits.
- Class B: The Rule requires that pathogens be significantly reduced but not below detectable levels for Class B biosolids and sets site restrictions and farm management practices to be used when applying such biosolids.

An EPA OIG audit report, Biosolids Management and Enforcement, issued in March 2000 (No. 2000-P-10), disclosed that EPA does not have an effective program for ensuring compliance with the land application requirements of the Sludge Rule. Some of the points the report noted were:

- In fiscal 1998, EPA reviewed only about 38 percent of the annual reports submitted by sewage treatment plants. Two additional States have obtained delegation since our prior report. See Table 3. 4
- EPA performed few biosolids-related inspections of sewage treatment plant operations, virtually no inspections of land application sites, and few record inspections of treatment plants or land appliers.
- The biosolids program had been delegated to only three States, and there was virtually no Federal oversight of State biosolids programs in no delegated States. The report concluded that the almost complete absence of a Federal presence in the biosolids program was a result of the low priority given to biosolids management by EPA's Office of Water and the decision of EPA's Office of Enforcement and Compliance Assurance not to commit resources to biosolids.

Table 1: Biosolids Staff in EPA Headquarters Offices EPA Office Biosolids FTEs Office of Water 4.0 Office of Research and Development 1.6 Office of General Counsel 0.2 Office of Enforcement and Compliance Assurance 0.0 Total 5.8 As can be seen from the table, the Office of Water provides the majority of the Headquarters FTEs managing the biosolids program, while the Office of Enforcement and Compliance Assurance (OECA) provides none, even though it has program responsibilities. As we explained in our prior report, that office has disinvested from the biosolids program.

EPA Regional Coordinators informed us that among the 10 Regional offices, approximately 10 FTEs were dedicated to managing biosolids in fiscal 2000. However, our prior audit noted that the Regions had dedicated approximately 18 FTEs in fiscal year 1998 to managing biosolids. Thus, in 2 years, there was a significant drop in the Regional staffing levels for this program. (Because the prior report concentrated on the Regions, we were not able to compare the fiscal 2000 levels for Headquarters personnel with fiscal 1998 levels.) Further, our review of EPA Regional FTEs

dedicated to enforcement of the Sludge Rule showed that the FTEs declined from slightly more than seven in fiscal year 1998, to slightly less than four in fiscal year 2000. Administrator for the Office of Water stated, "a program for regulation, compliance oversight, and enforcement of biosolids use and disposal exists in every State."

Further, in June 2001, the then Acting Assistant Administrator for the Office of Water stated in response to the final version of our prior report that, "Many States have excellent oversight programs."

However, comments from State Biosolids Coordinators at the 2001 National Biosolids Conference indicated that biosolids program staffing levels may not be adequate:

- How do we run our program with fewer resources and deal with septage, delegation, pollutants of concern, odors, rising energy costs, and composting?
- There remains a critical lack of resources at both the State and Federal levels.
- We don't have the resources to find out causes of problems.
- Is there any way to obtain more resources?

In our previous report we said that, "EPA cannot assure the public that current land application practices are protective of human health and the environment."

Given the almost 50-percent reduction in EPA enforcement resources and the number of States with one or fewer FTEs devoted to biosolids, we believe this conclusion is equally valid today.

A third State official noted that it took a cryptosporidium outbreak to get dollars shifted to drinking water research. Related to this issue, another State official opined that a similar outbreak involving land-applied biosolids would probably result in the abolishing of land application rather than research; however, this official believed that the States would probably get out of land application before such a crisis actually occurred.

Further, State Biosolids Coordinators have expressed concerns regarding EPA's shift from advocacy of land application to a neutral position, without any written explanation. According to Office of Water senior managers, EPA used to be proactive in promoting biosolids land application because it is consistent with recycling. However, a recent Assistant Administrator decided the Agency should instead be method-neutral; i.e., regulators should not be promoters of any one of the management methods over another described in the Sludge Rule. While some Office of Water senior managers said they did not see the shift as a major change, some State coordinators believed otherwise.

In addition, on various occasions dating back to 1998, the Wisconsin State Biosolids Coordinator, who said he had broad State consensus, expressed concerns directly to senior EPA officials. In an October 1998 letter he urged EPA to financially support biosolids research and development, as well as the Pathogen Equivalency Committee. The representative also requested that EPA have a dedicated Biosolids Coordinator in every Region to maintain oversight of the entire program. He does not expect additional funding to be available for biosolids efforts.

This was confirmed in a January 2002 response to our prior audit. The response, from the Assistant Administrator for Water and the Acting Assistant Administrator for Enforcement and Compliance Assurance, stated: Implementation of most, if not all, of the recommendations ... Would require additional resources in terms of people and dollars which are simply not available. We have only finite resources to support a large number of responsibilities to address risks to the nation's water resources ... we believe the level of resources currently allocated to the biosolids program is appropriate when balanced against competing priorities.

Section 405 of the Clean Water Act gives EPA the authority to delegate the biosolids program to the States, but little progress has been made thus far. Because only five States have received

formal delegation from EPA for the biosolids program, and EPA devotes few resources to the program, there has been minimal implementation of the Federal biosolids program.

In contrast to EPA, Maryland has implemented a more centralized, automated approach. According to a State official, Maryland has a single database to handle complaints for all program areas, not only biosolids, and has also developed an electronic form for recording and investigating biosolids odor complaints.

Maryland has devoted more staff to running its biosolids program (12) than all but one other State. Maryland's 12 FTEs in 2000 were more than that of all 10 EPA Regional offices combined. Further, the letter from the land application company noted:...better tracking of odor and any health complaints is essential for improving land application of biosolids and its public acceptance.... [O]ne resolution is to initiate a regulatory requirement for a comprehensive cradle-to-grave tracking system. This could be accomplished without high cost by using modern computerized tracking tools. It could also be managed at the state and local level, where it could be integrated with local and state public health agencies, as appropriate.

EPA chose operational standards to manage the risks from pathogens (disease-causing organisms) and vectors (disease-carrying insects or animals) in sludge, because, due to insufficient data, a risk assessment was not conducted on pathogens.

As described in the Sludge Rule Preamble, EPA conducted an extensive risk assessment on the potential for adverse effects on public health and the environment from pollutants in sludge. However, the Preamble also describes uncertainties in some important aspects of the risk assessment related to human.

The less conservative geometric mean was calculated for these plant uptake studies rather than the more conservative arithmetic mean. Pollutant (metals) concentrations in Table 3 of section 503.13 of the Sludge Rule. 17 health, human exposure pathways, plant toxicity and uptake, effects on wildlife, and ground water impacts. Due to these uncertainties, EPA made many conservative assumptions as well as some less conservative assumptions for the Sludge Rule. For example, there was a conservative assumption that humans may be more sensitive to a pollutant than animals tested when, in fact, this may not be the case.

Another conservative assumption was that a human may be exposed to a pollutant in biosolids for a lifetime whereas the period of exposure may, in fact, be much shorter. Other conservative assumptions related to plant uptake of metals, application rates, soil ingestion, concentrations of pollutants in sludge, ground water contamination, and inhaling organic pollutants. In general, EPA may adopt a less conservative assumption when the conservative assumption is judged to be unrealistic.

Because there were issues EPA could not resolve before a court-ordered deadline for the Rule's publication, a commitment was made to perform further research (a comprehensive evaluation and monitoring study). However, due to competing priorities and EPA's determination that biosolids were low risk, only one major study, known as the Oak Ridge Study, was initiated as a result of the commitment. The final draft of the Oak Ridge Study report⁸ was not peer reviewed and is not officially endorsed by EPA although it was released to the public at the request of a U.S. Senator.

Other studies have been conducted on sewage sludge issues since promulgation of the Rule, but these studies were conducted for purposes other than to address the comprehensive study commitment in the Preamble. Further, there has been no formal process to compare results from these other studies to the Sludge Rule's risk assessment uncertainties. There are no plans to complete the comprehensive study, and uncertainties remain unaddressed by further research.

In spite of the lack of a risk assessment on pathogens for the Sludge Rule, the only research on

pathogens committed to in the Preamble concerned the ecological effects from pathogens. However, there are indications that more research is needed on risks to human health from pathogens in sludge. When the Sludge Rule was promulgated in 1993, due to safety and liability questions, the food processing industry was reluctant to accept the practice of using treated wastewater and sludge in producing food for human consumption.

Scientists at the 2001 Cincinnati workshop on pathogens were also concerned about the salmonella test. In addition, the Council report recommended that EPA reevaluate the 30-day waiting period for grazing animals after Class B sludge is applied to fields. This recommendation was due to a finding in Denmark that tapeworms may survive in sludge-treated fields for up to one year. This was another area of concern for scientists at the Cincinnati workshop. Should there be revisions to the Rule based on subsequent research results?

The National Whistleblower Center letter stated that EPA's support of the Water Environment Federation "creates an appearance of impropriety." For several years, EPA has made large dollar awards of assistance to two non-profit organizations, the Water Environment Federation (WEF), a professional association, and the Water Environment Research Foundation (WERF). The latter is a research organization that WEF established. During the 3 years ending September 30, 2001, EPA awarded \$3.2 million to WEF and \$9.7 million to WERF, for a total of \$12.9 million. However, 96 percent of the financial support that EPA gave to WEF and WERF was Congressionally mandated (\$2.8 million of the \$3.2 million awarded to WEF, and \$9.6 million of the \$9.7 million awarded to WERF). Therefore, EPA had no discretion in awarding these funds.

We did not perform a financial audit of any of these awards, nor did we look at allowability of costs for any expenditures associated with these awards. The results of the interviews and survey did not indicate a lack of quality management procedures in WERF research projects; however, our survey instrument did not allow us to reach definitive conclusions about quality management procedures in WERF projects.

Even with site (10 A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule, EPA 832-B-93-005, September 1995. 23) restrictions designed to minimize the potential for human contact, concerns have been raised in some magazine and newspaper articles and by some members of the public about the possible health effects from contact with biosolids, including inhaling biosolids dust. The National Whistleblower Center alleged that complainants have experienced adverse health effects such as nausea, burning eyes, dizzy spells, respiratory symptoms, and even death resulting from biosolids.

Our prior audit report of March 2000 that EPA does not have an effective program for ensuring compliance with land application requirements, e.g., crop harvesting and site access restrictions.

There is another concern related to Class A biosolids. Sewage treatment plants are allowed six alternatives for meeting Class A pathogen requirements (i.e., reduction of pathogens to below detectable levels). Of the six alternatives, two of those (Alternatives 3 and 4) have been criticized by some EPA and State officials, as well as by a land applier, for not being sufficiently protective. When Class A Alternatives 1, 2, or 5 are used for meeting pathogen requirements, treatment methods are described and required by the Rule. When Alternative 6 is used, the treatment method must be approved by the permitting authority. However, for Alternatives 3 and 4 a treatment method is not specified. A facility can designate its biosolids as Class A based on the absence of fecal coliform or salmonella and the absence of enteric viruses and viable helminth ova.

These two alternatives have been criticized because the absence of enteric viruses and helminth ova may not indicate the absence of other disease-causing organisms in the biosolids.

Once biosolids leave the control of the preparer, there are no regulations over land application of EQ biosolids, and there are reduced requirements for land application of Class A biosolids not designated EQ. Therefore, good controls are necessary to ensure that production of such biosolids meets pathogen requirements.

It has been recommended by some Federal and State officials and by at least one member of the land application industry that the Sludge Rule be changed to either eliminate or modify Alternatives 3 and 4. As stated in the 1996 National Research Council report, "General acceptance of sludge application for food crop production probably hinges most on the development of successfully implemented projects that meet State and Federal regulations and address local public concerns." This means that adequate oversight and enforcement of Class A and Class B standards are necessary for public confidence in land application.

Truck traffic around land application sites is also a quality of life concern. According to the EPA Region 9 Biosolids Coordinator, heavy truck traffic caused 25 concerns in two California counties and was a factor in both counties' decisions to limit land application. Biosolids are typically delivered to application sites in tractor trailers or tanker trucks. Application rates generally equate to about one tractor trailer truckload per acre. Therefore, a 50-acre field could receive about 50 truckloads of biosolids. In Virginia alone, biosolids were land applied on more than 39,000 acres in the year 2000. This suggests that as many as 39,000 truckloads of biosolids were on the road in Virginia that year. **BIG-addendum note:VDH records show 89,000 acres utilized in 2003 (89,000acres applied; above calculation=89,000 truck loads with 58% of sludge pollution imported).**

The Agency does not have a centralized system to keep track of the complaints of adverse health effects that are reported. Not addressing public concerns about safety, gaps in the science, fear of long-term impacts, or any other real or perceived concern may result in severely limiting or halting the practice of biosolids land application.

Land application of biosolids varies by State, as well as by county within States. When we sought by-county data, we found that many States do not collect information by county on land application. However, we were able to obtain data on land application by county from seven States: Colorado, Florida, Maryland, New Jersey, New York, Virginia, and Wisconsin. This group of States includes a large importer of biosolids (Virginia); a large exporter of biosolids (New York); and a State to which EPA has delegated the biosolids program (Wisconsin)."

Acreage for VA communities: Fredrick - 1, Loudoun - 2, Fauquier - 8, Prince William - 9, Rockingham - 15, Culpeper - 19, Stafford - 21, Augusta - 23, Orange - 26, King George - 28, Westmoreland - 30, Essex - 35, Louisa - 36, Richmond - 37, Hanover - 44, King and Queen - 46, King William - 48, Botetourt - 55, Cumberland - 58, Henrico - 60, Powhatan - 61, Bedford - 64, Charles City - 73, Montgomery - 81, Dinwiddie - 93, Pulaski - 97, Franklin - 99, Pittsylvania - 105, Virginia Beach-117, Chesapeake-126.

Year 2000: Virginia 792 (sewage treatment plants); 225,000 dry tons (generated sewage sludge pollution); 95,868 dry tons (instate generated & land applied) ;78,437 dry tons (imported & land applied); < 1,000 (exported sludge). **As reported by the waste industry applicators, VDH does not confirm. (BIG-addendum note)**

Office of Water Comments on OIG's 10/Office 26/01 Status Report: point out that most state program requirements are now comparable or more restrictive than the Part 503 requirements, although you do include a quote from a member of the regulated community that "Many states also go beyond what is required in Part 503 with regard to management practices ..."; "Revise the paragraph to delete the reference to the Agency being practice-neutral with respect to biosolids management. The Agency does support beneficial reuse of biosolids, but it is the responsibility of

local government to make local decisions regarding use and disposal options that are consistent with 40 CFR Part 503. As a result, we do not take an active role in choosing a specific use or disposal method."; "Actually, only a portion of the \$1 million was ever allocated to the ecological impact study and additional funding was used to support hydrologic groundwater modeling efforts by the Athens R&D Lab that were eventually delivered to OST.;

"In the section on Class A vs. Class B Biosolids, the following statement (on page 35) is erroneous "These alternatives [Alternatives 3 and 4] have been criticized because the fact that certain indicator organisms are present or not present tells nothing about whether there are other pathogenic organisms in the biosolids." The statement is erroneous because, for both alternatives, a demonstration must be made that there is an absence of Salmonella, Enteric virus, and viable helminth ova."; "

BIG-addendum Note:

The listed excerpts from the 2002 EPA Inspector General's Report, consisting of 59 pages and prior I. G. reports , reflects why Virginians must be concerned.

This work in no way reflects the entirety of the Report nor any assumption to creditability. The reader may visit the 59 pages report for clarification.

The enclosed information is relative to public concerns and issued for that sole purpose of exhibiting those selected concerns.

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